



H.F.R.I.
Hellenic Foundation for
Research & Innovation

Description of the funded research project
1st Call for H.F.R.I. Research Projects to Support Faculty
Members & Researchers and Procure High-Value
Research Equipment

Title of the research project:
**Beneficial Microbes to Optimize pest control in
Sustainable Tomato production**

BeM^{OST}

Principal Investigator: Maria L. Pappas

Reader-friendly title: Microbes effects against tomato pests

Scientific Area: Agricultural Sciences

Institution and Country: Democritus University of Thrace,
Greece

Host Institution: Democritus University of Thrace

Collaborating Institution(s): University of Thessaly,
University of Hohenheim, German Centre for Integrative
Biodiversity Research

Project webpage: <https://bemost.agro.duth.gr/>



Budget: 180.000 euro

Duration: 36 months

Research Project Synopsis

Herbivorous pests are major threats to global food security as they can be responsible for high economic losses caused by biotic agents in crop production. Biological control i.e. the use of beneficial organisms to control harmful pests is the most cost-effective and environmentally friendly alternative to chemical control. Among biological control agents, mutualistic soil-borne microbes are of particular interest as they can induce defence mechanisms that plants employ to protect themselves against herbivores. BeMOST studies the plant-mediated effects of commercial and lab-owned microbial strains against herbivorous pests, their natural enemies, and the plant itself, focusing on the molecular and chemical mechanisms underlying these effects. Finally, BeMOST validates the obtained molecular and ecological results in greenhouse conditions.

Project originality

BeMOST will advance our knowledge on plant-microbe-arthropod interactions which is a modern but understudied research topic, and also offer novel tools in crop protection. Activating the plant's inherent defense system by soil-borne beneficial microbes is a novel strategy to biologically fend off plants enemies. Only a few of these microbes are currently marketed as plant growth regulators and/or bio-fungicides and little is known on their impact on herbivorous pests. BeMOST assesses the efficacy of selected soil-borne microbes, including marketed ones and the foundation for the development of new biocontrol microbials as well as for the identification of unexplored functions for their use against pests are set. BeMOST research team consists of researchers with ample experience in the areas of ecology, molecular biology, and plant-microbe interactions and this project will form a novel platform for training two PhD students and one postdoc in these fields and thus bring together the traditionally separated fields of research.

Expected results & Research Project Impact

BeMOST will produce new scientific knowledge and will bring benefits to agriculture, the economy and the society. It will promote our understanding of complex direct and indirect biological interactions related to the induction of plant defense responses in one of the most important vegetable crops in Europe and worldwide. With the use of beneficial microorganisms that improve growth and enhance plant defense mechanisms, BeMOST will improve biological control of pests of economic importance, reducing the dependence of producers on the use of synthetic plant protection products. Two PhD students and a postdoctoral researcher participate in BeMOST; It is therefore anticipated the project to contribute to the development of the next generation of researchers in the field of chemical and molecular ecology in Greece.

The importance of this funding

The funding of BeMOST was a unique opportunity that made possible the addition of three young researchers to the research group of the Laboratory of Agricultural Entomology & Zoology at Democritus University of Thrace.

In addition, through BeMOST, the fundamentals were set for a stable collaboration between the host laboratory and members of three internationally known research groups, from Greece and Germany. This collaboration is expected to impact positively both the success of the project and the further scientific development of the BeMOST research team members.



H.F.R.I.
Hellenic Foundation for
Research & Innovation

COMMUNICATION

185 Syggrou Ave. & 2 Sardeon St. 2
171 21, N. Smyrni, Greece
+30 210 64 12 410, 420
communication@elidek.gr
www.elidek.gr